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EXAMINER
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* LOTTE RUGHOLM HENRIKSEN and ERIK MARCUSSEN

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Appeal 2008-1881  
Application 10/618,477  
Technology Center 1600

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Decided: July 8, 2008

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Before TONI R. SCHEINER, DEMETRA J. MILLS, and RICHARD M.  
LEBOVITZ, *Administrative Patent Judges*.

LEBOVITZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 34-38 and 40-52. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

STATEMENT OF THE CASE

The appealed claims are directed to a solid composition comprising phytase enzyme and corn steep liquor which is present in an amount sufficient to stabilize the phytase. According to the Specification, phytase

was known as an animal feed supplement to eliminate the anti-nutritional effects of phytic acid (Spec. 1: 15-19). Corn steep liquor is added to the phytase composition to stabilize it (Spec. 1: 12-14).

Claims 34-53 are pending. Claims 34-38 and 40-52<sup>1</sup> stand rejected as unpatentable over De Lima (U.S. Pat. No. 6,136,772, Oct. 24, 2000) in view of Linton (U.S. Pat. No. 4,859,485, Aug. 22, 1989) and Akhtar (U.S. Pat. No. 5,750,005, May 12, 1998) (Ans. 4). Appellants provide separate arguments for claims 37 and 38; hence, these claims stand or fall apart from claims 34-36 and 40-52 which were argued as a group. *See* 37 C.F.R. § 41.37(c)(1)(vii). Claims 34, 37, and 38, which are representative of the appealed subject matter, read as follows:

- 34. A solid phytase composition, comprising:
  - (a) an enzyme having a phytase activity of above 20 FYT<sup>[2]</sup>/g of the composition, and
  - (b) corn steep liquor in an amount sufficient to stabilize the enzyme having phytase activity.
- 37. The composition of claim 34, further comprising a starch material.
- 38. The composition of claim 34, further comprising wheat starch.

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<sup>1</sup> Claims 39 and 53 were rejected over prior art in the Final Office Action (*see* Final Office Action 5). In the Answer, the Examiner dropped certain of the prior art rejections. However, there was no explanation in the record as to why the Examiner omitted claims 39 and 53 from the rejection which had been carried over from the Final Office Action.

<sup>2</sup> “FYT” refers to a unit of enzyme activity, “one FYT being the amount of enzyme that liberates 1 micro mole inorganic ortho-phosphate per min” under specific conditions (Spec. 2: 32-36).

## ISSUE

Once prima facie obviousness has been established by the Examiner, Appellants have the burden of providing rebuttal arguments or evidence. *Hyatt v. Dudas*, 492 F.3d 1365, 1369-70 (Fed. Cir. 2007). In this case, Appellants contend that the Specification provides evidence of “surprising and unexpected” results which are sufficient to rebut the Examiner’s conclusion of obviousness based on the prior art (App. Br. 13). The Examiner contends that Appellants’ evidence is insufficient because the asserted result would have been an inherent property of using the prior art for its known purpose (Ans. 8-9).

Thus, the issue in this appeal is whether the Examiner erred in concluding that Appellants’ evidence of unexpected results is insufficient to overcome the obviousness rejection.

## FINDINGS OF FACT (“FF”)

In making an obviousness determination, the Examiner must first identity the scope and content of the prior art and then ascertain the differences between the prior art and the claimed invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). Thus, we first turn to the prior art. The following numbered findings of fact (“FF”) summarize the prior art relied upon by the Examiner in setting forth the basis of the rejection.

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### *Scope and contents of the prior art*

#### *De Lima Patent*

1. De Lima describes an enzyme-containing granule which comprises an enzyme and an absorbent core. The enzyme is preferably absorbed and

adhered to the outer surface of the core (De Lima, at col. 2, ll. 9-34; at col. 3, ll. 57-63; Ans. 4).

2. Preferred cores contain starch and/or modified starches (De Lima, at col. 5, ll. 22 to col. 6, ll. 21).

3. Example 26 is of starch cassava granules coated with phytase to a concentration of 10,700 FYT/g (*id.* at col. 36, ll. 15-32; Ans. 5).

4. The phytase/cassava starch granules were mixed with commercial piglet feed composition (*id.* at col. 36, ll. 55-65; Ans. 5)

5. Phytase activity in the starch coated granules was higher as compared to commercial and uncoated granules, “thus demonstrat[ing] that the formulation of enzymes as granules based on starch-based cores can result in very substantial protection of the enzyme content thereof against deactivation” (*id.* at col. 37, ll. 1-13; *see* Ans. 5).

*Linton Patent*

6. “Linton . . . disclose[s] an animal feed supplement containing a mixture of wet corn bran and corn steep liquor (col. 3, lines 55-60)” (Ans. 5).

*Akhtar Patent*

7. “Akhtar discloses that corn steep liquor is used as a liquid supplement . . . (col. 6, lines 30-35)” for livestock (Ans. 6).

*Differences between the claimed invention and the prior art*

Once the scope and contents of the prior art has been determined, the next step is to identify the differences between the prior art and the claimed invention. *Graham*, 383 U.S. at 17. The following numbered findings of fact are pertinent to this issue.

8. Claim 34 is directed to a solid phytase composition comprising: (a) phytase enzyme having an activity of above 20 FYT/g of the composition; and (b) “corn steep liquor in an amount sufficient to stabilize” the phytase.
9. The prior art cited by the Examiner does not describe a composition comprising phytase and corn steep liquor.
10. However, the Examiner finds that De Lima describes a phytase-containing granule having 10,700 FYT/g which meets the limitation of claim 34 of “(a) an enzyme having a phytase activity of above 20 FYT/g of the composition” (FF 1-3; Ans. 4-5).
11. The Examiner also finds that Linton and Akhtar each teach corn steep liquor in an animal feed (FF 6, 7; Ans. 5-6) as in (b) of claim 34.

*Reason to combine the prior art*

The next step after ascertaining the differences between the prior art and the claimed invention is to identify motivation or a reason why persons of ordinary skill in the art would have been prompted to combine the prior art to have made the claimed invention. *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007). The following findings are relevant to this determination.

12. The Examiner concludes that it would have been obvious to persons of ordinary skill in the art to have combined De Lima’s phytase granules with corn steep liquor as described in Linton and Akhtar (FF 11), each of which were used in animal feeds (FF 4, 6, 7), because the latter is “a source of readily available soluble nutrients, [and] an economical source of protein and [an] excellent source of energy and phosphorus” (Ans. 6).

*Analysis*

Appellants contend that “none of the cited references suggests that corn steep liquor stabilizes a phytase contained in animal feed composition, as demonstrated in the present application” (App. Br. 12). They state that Examples 4-7 of the Specification demonstrate that the stability of phytase is significantly improved after adding corn steep liquor and that such “showing is surprising and unexpected and overcomes any assertion of obviousness based on the cited art” (App. Br. 13).

The Examiner contends that Linton and Akhtar provide the motivation to have used corn steep liquor in combination with De Lima’s phytase starch granules (FF 12) and that its property in stabilizing the formulation would have been an inherent when it is utilized for its known purpose in animal feeds (Ans. 8-9). Thus, the Examiner concludes that the evidence of unexpected results is unpersuasive.

Once *prima facie* obviousness has been established, an applicant for a patent can rebut it with “a showing of ‘unexpected results,’ i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected. The basic principle behind this rule is straightforward - that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious.” *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995). To establish unexpected results, the claimed subject matter must be compared with the closest prior art. *In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991); *see also In re Johnson*, 747 F.2d 1456 (Fed. Cir. 1984); *In re Merchant*, 575 F.2d 865 (CCPA 1978).

In this case, Appellants do not challenge the Examiner's conclusion (FF 12) that the claimed subject matter is prima facie obvious over the cited prior art. Instead, they come forward with evidence which they contend rebuts prima facie obviousness by establishing "surprising and unexpected" results for the claimed subject matter (App. Br. 13). These results purport to show that the corn steep liquor "significantly" improves the stability of phytase in a composition as compared to a control which lacks the liquor (App. Br. 12-13). The Examiner rejects this evidence because he contends that the prior art suggests combining phytase with corn steep liquor and that the liquor's effect in stabilizing phytase would have been an inherent property of the obvious combination (Ans. 8-9).

The Examiner erred in not considering Appellants' evidence of unexpected results. It is true that there are cases in which the recognition of inherent properties by a patent applicant were rejected as a basis to establish nonobviousness. For example, in *Baxter*, 952 F.2d at 392 (Fed. Cir. 1991), it was stated that "[m]ere recognition of latent properties in the prior art does not render nonobvious an otherwise known invention." In *Baxter*, the applicant had argued that the claimed plasticized blood donor bag comprised of DEHP had unexpected properties in suppressing hemolysis of red blood cells stored inside it. *Baxter*, 952 F.2d at 389. The court found that such evidence was insufficient to rebut prima facie obviousness because the prior art disclosed a DEHP-plasticized donor bag, and therefore, Baxter's blood bag had the same hemolytic-suppressing function as the prior art – albeit unknown at the time of the invention. *Baxter*, 952 F.2d at 391. Thus, the court did not depart from the principle that unexpected results can be relied upon to rebut prima facie obviousness, but rather found that the property



relied upon by the applicant would have been possessed by the closest prior art. *Id.*

*Baxter* reaffirmed the recognized legal principle that “when unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art.” *Id.* Nonetheless, *Baxter* clarified that a result might be “unexpected” because it was unappreciated by persons of skill in the art – but that such result would still be insufficient to rebut prima facie obviousness when it would also have been obtained with the closest prior art.

In *Ex parte Obiaya*, 227 USPQ 58, 60 (BPAI 1985), the Appellant had asserted “unexpected results” obtained when a prior art labyrinth heater was utilized in an oxygen concentration analyzer. The Board found Appellant’s evidence unpersuasive because

the references disclosing labyrinth heaters indicate that the advantage obtained by using such heaters is that samples are maintained at a uniform temperature. The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.

(*id.*) We clarify that, as in *Baxter*, an unrecognized “advantage” would not have been a basis for patentability in circumstances where both the claimed invention and the closest prior art exhibited it. The rationale is straightforward: the claimed invention would add nothing to the prior art. However, an “advantage”, which is the outcome of an invention suggested by the prior art, can be a proper basis for patentability – as long as the advantage is not possessed by the closest prior art and leads to a result in comparison to this prior art that would not have been expected by persons of

ordinary skill in the art. To the extent that *Obiaya* could be read differently, we conclude that such a reading would not be consistent with the relevant legal principles to be applied when considering evidence of unexpected results.

While all evidence, including unexpected results, must be considered in evaluating the obviousness of a claimed invention (*Soni*, 54 F.3d at 750),

[t]he existence of such evidence, however, does not control the obviousness determination. *See Newell*, 864 F.2d at 768 (“First, as indicated, obviousness is not a factual inference; second, although these factors must be considered, they do not control the obviousness conclusion.”) (citations omitted); *Ryko*, 950 F.2d at 719 (the weight of secondary considerations may be of insufficient weight to override a determination of obviousness based on primary considerations). Therefore, we must consider all of the evidence under the Graham factors before reaching our decision.

*Richardson-Vicks Inc. v. The Upjohn Co.*, 122 F.3d 1476, 1483 (1997).

In sum, the threshold question is whether Appellants’ evidence of unexpected results is based on a comparison with the closest prior art. Next, the Examiner must determine whether the property relied upon as a basis of the unexpected results would also have been possessed by the closest prior art. Finally, the evidence of unexpected results must be weighed against the totality of the evidence in the record, including the scope and content of the prior art and the level of ordinary skill in the art.

Here, we find Appellants’ evidence defective because they did not explain, and it is not evident from the record, whether the comparison that serves as the basis for the “unexpected and surprising” results was performed with the closest prior art. Our reasoning is explained in more detail below. Because the Examiner improperly failed to consider this

evidence, we designate our rationale as a new ground of rejection under 37 CFR § 41.50(b) to provide Appellants an opportunity to respond to it.

#### Claims 34-36 and 40-52

Appellants rely upon Examples 4-7 of the Specification as evidence that the claimed invention would not have been obvious to persons of ordinary skill in the art. When unexpected results are used as evidence of nonobviousness, the results must be compared to the closest prior art. *Baxter*, 952 F.2d at 392. Here, it is not evident from the record whether the comparisons performed in Examples 4-7 were with the closest prior art. Appellants have not stated that the comparison described in the examples is with the closest prior art. Examples 4 and 5 of the Specification refer to a “control” prepared “according to the method of Example 3” (Spec. 16: 20-22), but it is not clear whether the granules produced by this method are the closest prior art in the context of the rejection of record, e.g., De Lima’s phytase/starch cassava granule (FF 3, 4).

Similarly, we can not discern whether the controls utilized in Examples 6 and 7 of the Specification represented the closest prior art. For this reason, we do not find Appellants’ evidence sufficient to rebut the Examiner’s prima facie case of obviousness. Consequently, we affirm the rejection of claims 34 and dependent claims 35, 36, and 40-52.

#### Claim 37

Claim 37 is directed to the solid composition of claim 34, further comprising a starch material. Appellants contend that the examples in the Specification show that “the combination of a starch material and corn steep

liquor further improves the stability of the enzyme having phytase activity. This property . . . is not predicted by the prior art. Thus, the showing is surprising and unexpected” (App. Br. 14).

Appellants have not established that the comparison was performed with the closest prior art. Thus, we affirm this rejection for the same reason as for claim 34. Furthermore, we note that De Lima teaches that starch coated granules “result in very substantial protection of” phytase activity (De Lima, at col. 37, ll. 1-13; FF 5). Thus, it appears that improved stability would have been expected from the prior art, contrary to Appellants’ conclusion (App. Br. 14). Moreover, since starch is present in De Lima’s granules, the result of using it is a property of the closest prior art and not a basis to rebut prima facie obviousness. *See Baxter*, 952 F.2d at 392.

#### Claim 38

Claim 38 is directed to the solid composition of claim 34, further comprising wheat starch. Appellants contend that the examples in the Specification show that “the combination of wheat starch and corn steep liquor further improves the stability of the enzyme having phytase activity. This property . . . is not predicted by the prior art. Thus, the showing is surprising and unexpected” (App. Br. 14).

Appellants have not established that the comparison was performed with the closest prior art. Thus, we affirm this rejection for the same reason as for claim 34. Furthermore, we note that De Lima teaches that starch coated granules “result in substantial protection of” phytase activity (De Lima, at col. 37, ll. 1-13; FF 5). Thus, it appears that improved stability would have been expected from the prior art, contrary to Appellants’

conclusion (App. Br. 14). Moreover, since starch is present in De Lima's granules, the result of using it is a property of the closest prior art and not a basis to rebut prima facie obviousness. *See Baxter*, 952 F.2d at 392.

### CONCLUSION

In summary, we affirm the rejection of claims 34-38 and 40-52 as obvious over prior art, but designate the affirmance as a new ground of a rejection as our analysis differs from that of the Examiner.

### TIME PERIOD

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)). 37 C.F.R. § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 C.F.R. § 41.50(b) also provides that the Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) Reopen prosecution. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the Examiner, in which event the proceeding will be remanded to the Examiner. . . .

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(2) Request rehearing. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

AFFIRMED/37 C.F.R. § 41.50(b)

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